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## European technical approval

**ETA-10/0292**

(English language translation, the original version is in German language)

Handelsbezeichnung:  
*Trade name:*

**Hilti Firestop Acrylic Sealant CFS-S ACR**

Zulassungsinhaber:  
*Holder of approval:*

**Hilti AG  
Feldkircherstrasse 100  
9494 Schaan  
Liechtenstein**

Zulassungsgegenstand  
und Verwendungszweck:

**Acryl-Brandschutzdichtmasse für die Verwendung in  
Abschottungen**

*Generic type and use of  
construction product:*

**Acrylic Firestop Sealant for use in penetration seals**

Geltungsdauer vom:  
*Validity from:*  
bis:  
*to:*

**31.01.2013**

**30.01.2018**

Herstellwerk:  
*Manufacturing plant:*

**Hilti Werk CP 606  
Hilti Werk 4a**

Diese Europäische  
technische Zulassung umfasst:  
*This European technical approval  
contains:*

**24 Seiten inklusive 14 Anhängen**

*24 pages including 14 Annexes*

Diese Europäische  
technische Zulassung ersetzt:  
*This European technical approval  
replaces:*

**ETA-10/0292 mit Geltungsdauer vom 22.11.2010 bis  
21.11.2015**

*ETA-10/0292 with validity from 22.11.2010 to 21.11.2015*



European Organisation for Technical Approvals  
Europäische Organisation für Technische Zulassungen  
Organisation Européenne pour l'Agrément Technique

## **I LEGAL BASES AND GENERAL CONDITIONS**

- 1 This European technical approval is issued by Österreichisches Institut für Bautechnik in accordance with:
  - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products <sup>1</sup> modified by Council Directive 93/68/EEC <sup>2</sup> and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council <sup>3</sup>;
  - Bauproduktengesetz. LGBl. V Nr. 33/1994;
  - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC<sup>4</sup>;
  - Guideline for European technical approval of Fire Stopping and Fire Sealing Products: Part 2: Penetration Seals.
- 2 The Österreichisches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant(s). Nevertheless, the responsibility for the conformity of the products to the European technical approval and for their fitness for the intended use remains with the holder of the European technical approval.
- 3 This European technical approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European technical approval.
- 4 This European technical approval may be withdrawn by Österreichisches Institut für Bautechnik, in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.
- 5 Reproduction of this European technical approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Österreichisches Institut für Bautechnik. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European technical approval.
- 6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated in EOTA. Translations into other languages have to be designated as such.

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<sup>1</sup> Official Journal of the European Communities N° L 40, 11.2.1989, p. 12

<sup>2</sup> Official Journal of the European Communities N° L 220, 30.8.1993, p. 1

<sup>3</sup> Official Journal of the European Union N° L 284, 31.10.2003, p.1

<sup>4</sup> Official Journal of the European Communities N° L 17, 20.1.1994, p. 34

## **II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL**

### **1 Definition of product(s) and intended use**

#### **1.1 Definition of the construction product**

Hilti Firestop Acrylic Sealant CFS-S ACR is a 1-component product and is composed essentially of filling substances and an acrylic binder. It is delivered in various colours.

Hilti Firestop Acrylic Sealant CFS-S ACR is supplied in 310 ml cartridges, 580 ml foil packs, 5 Liter buckets and 19 Liter buckets. The sealant is installed in the annular space formed by the service and the edge of the opening in the building element, normally together with a backfilling material.

Installation of Hilti Firestop Acrylic Sealant CFS-S ACR – see 4.3.

Ancillary products referred to in this European technical approval within the framework of evaluating resistance to fire (see Annexes 1 and 2) are not covered by this ETA and cannot be CE-marked on the basis of it.

#### **1.2 Intended use**

Hilti Firestop Acrylic Sealant CFS-S ACR is intended to form part of a penetration seal, which is used to maintain the fire resistance of a separating element (wall or floor) when and where services pass through. It is used in conjunction with mineral wool as backfilling material. For specification of suitable mineral wool see Annex 1.

The specific separating elements that Hilti Firestop Acrylic Sealant CFS-S ACR may be used to provide a penetration seal in, are as follows:

- a) Flexible walls: The wall must have a minimum thickness of 100 mm and comprise timber or steel studs lined on both faces with minimum 2 layers of 12,5 mm thick boards. For timber stud walls there must be a minimum distance of 100 mm of the seal to any stud and the cavity between stud and seal must be closed and minimum 100 mm insulation of Class A1 or A2 (in accordance with EN 13501-1) in the cavity between stud and seal.
- b) Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m<sup>3</sup>.
- c) Rigid walls: The wall must have a minimum thickness of 200 mm and comprise aerated concrete, concrete or masonry, with a minimum density of 550 kg/m<sup>3</sup>.
- d) Rigid walls: The wall must have a minimum thickness of 150 mm and comprise concrete or masonry, with a minimum density of 2400 kg/m<sup>3</sup>.
- e) Rigid floors: The floor must have a minimum thickness of 150 mm and comprise aerated concrete or concrete with a minimum density of 550 kg/m<sup>3</sup>.
- f) Rigid floors: The floor must have a minimum thickness of 150 mm and comprise concrete with a minimum density of 2400 kg/m<sup>3</sup>.

The separating elements must be classified in accordance with EN 13501-2 for the required fire resistance period or fulfil the requirements of the relevant Eurocode. This ETA does not cover use of this product as a penetration seal in sandwich panel constructions.

Hilti Firestop Acrylic Sealant CFS-S ACR may be used to provide a penetration seal with the following specific services, single only:

Metal pipes: Services as given in Annex 2

Al-composite pipes Services as given in Annex 2

Annex 2 gives details of penetration seals for which fire resistance tests were carried out. This ETA covers assemblies installed in accordance with the provisions given in 4.3 and Annex 2.

Hilti Firestop Acrylic Sealant CFS-S ACR is intended for environmental conditions as defined by use category Y<sub>2</sub> (intended for use at temperatures between -5 °C and + 70°C, but with no exposure to rain nor UV) according to EOTA TR 024.

Although a penetration seal is intended for indoor applications only, the construction process may result in it being subjected to more exposed conditions for a period before the building envelope is closed. For this case provisions shall be made to protect temporarily exposed penetration seals according to the instructions of the manufacturer.

The provisions made in this European technical approval are based on an assumed working life of Hilti Firestop Acrylic Sealant CFS-S ACR of 10 years provided the conditions laid down in sections 4 and 5 relating to manufacturing, installation, use and repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

## 2 Characteristics of the product and methods of verification

### 2.1 Reaction to fire

Hilti Firestop Acrylic Sealant CFS-S ACR fulfils the requirements for reaction to fire class "D - s1 d0" according to EN 13501-1.

### 2.2 Resistance to fire

The resistance to fire performance according to EN 13501-2 of penetration seals incorporating Hilti Firestop Acrylic Sealant CFS-S ACR with a mineral wool according to Annex 1 as backfilling material is given in Annex 2.

Information on ancillary products (mineral wool backfilling) which were tested within the framework of this European technical approval for evaluating resistance to fire are given in Annex 1.

Any changes in the material, the composition, the dimensions or the properties of the ancillary products shall be notified to Österreichisches Institut für Bautechnik without delay, which will decide whether a new assessment will be necessary.

### 2.3 Air permeability

The gas permeability regarding the gases air, nitrogen (N<sub>2</sub>), carbon dioxide (CO<sub>2</sub>) and CH<sub>4</sub> (methane) has been tested according to the principles of EN 1026 for an Acrylic Sealant thickness of 10 mm. The following flow rates per area (q/A) have been achieved for the given air pressure differences (Δp). The flow rate index indicates the type of gas:

*Gas permeability of Hilti Firestop Acrylic Sealant CFS-S ACR*

Δp [Pa]	q/A air [m <sup>3</sup> /(h·m <sup>2</sup> )]	q/A N <sub>2</sub> [m <sup>3</sup> /(h·m <sup>2</sup> )]	q/A CO <sub>2</sub> [m <sup>3</sup> /(h·m <sup>2</sup> )]	q/A CH <sub>4</sub> [m <sup>3</sup> /(h·m <sup>2</sup> )]
50	≤ 1,9E-06	≤ 1,1E-06	≤ 6,4E-05	≤ 4,3E-05
250	≤ 9,7E-06	≤ 5,5E-06	≤ 3,2E-04	≤ 2,1E-04

The declared values refer to a body of pure Hilti Firestop Acrylic Sealant CFS-S ACR without any penetrating installation.

### 2.4 Water permeability

The water permeability has been tested according to Annex C of ETAG 026-2. The specimen consisted of 2 mm Hilti Firestop Acrylic Sealant CFS-S ACR (dry film thickness) on mineral wool. Test result: Water tight to 1000 mm head of water or 9806 Pa.

## **2.5 Emission of dangerous substances or radiation**

Hilti AG have presented a Material Safety Data Sheet according to Regulation 1907/2006/EC, article 31 and a declaration that Hilti Firestop Acrylic Sealant CFS-S ACR is in compliance with Regulation 1907/2006/EC concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Confirmation has further been declared that toxic, carcinogenic, toxic for reproduction and mutagenic chemical substances of category 1 and 2  $\geq 0.1$  % w/w (Status: Regulation 790/2009/EC - 1st ATP of the Regulation 1272/2008/EC) are not used for Hilti Firestop Acrylic Sealant CFS-S ACR and that all other dangerous chemical substances have been considered for the classification of the products according to the Regulation 1272/2008/EC (classification, labelling and packaging of substances and mixtures, including amendments).

**Note:** In addition to the specific clauses relating to dangerous substances contained in this European technical approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.

## **2.6 Mechanical resistance and stability**

Due to the small size of penetration seals, made of Hilti Firestop Acrylic Sealant CFS-S ACR, impact tests and a classification according to EOTA TR 001 are not required.

## **2.7 Resistance to impact/movement**

See 2.6

## **2.8 Adhesion**

See 2.6

## **2.9 Airborne sound insulation**

Test reports from noise reduction according to EN ISO 140-3, EN ISO 20140-10 and EN ISO 717-1 have been provided.

The acoustic tests were performed in a flexible wall and in a rigid wall. Hilti Firestop Acrylic Sealant CFS-S ACR was tested as seal around a steel pipe, filled with concrete. The seal was 50 mm wide (annular space) and consisted of 160 mm mineral wool, covered by 20 mm Hilti Firestop Acrylic Sealant CFS-S ACR on both sides (rigid wall) and 50 mm mineral wool covered by 25 mm on both sides (flexible wall). This set up simulates a linear joint as well as a single penetration seal. The area of Hilti Firestop Acrylic Sealant CFS-S ACR was 0,0236 m<sup>2</sup>. The acoustic characteristics of the walls itself have not been measured. According to these tests reports the single number ratings are:

### **Flexible wall:**

Weighted element-normalized level difference:  $D_{n,e,w}$  (C; Ctr) = 60 (-4;-12) dB

From this  $D_{n,e,w}$  the weighted sound reduction index calculates to:  $R_w$  (C; Ctr) = 53 (-4;-12) dB

Structure of the flexible wall: 2 x 12,5 mm plasterboard on both sides of a 50 mm metal stud frame. The void was filled with a 50 mm mineral wool slab.

### **Rigid wall:**

Weighted element-normalized level difference:  $D_{n,e,w}$  (C; Ctr) = 58 (-2;-5) dB

From this  $D_{n,e,w}$  the weighted sound reduction index calculates to:  $R_w$  (C; Ctr) = 51 (-2;-5) dB

Structure of the rigid wall: 200 mm thick concrete wall with a density of 2000 kg/m<sup>3</sup> which was plastered on both sides.

It should be noticed that both above mentioned results apply to the total wall construction of the size  $S = 1,25 \text{ m} \times 1,50 \text{ m}$  ( $= 1,88 \text{ m}^2$ ), i.e. the given wall with  $0,0236 \text{ m}^2$  Hilti Firestop Acrylic Sealant CFS-S ACR.

$D_{n,e,w}$ : weighted element-normalized level difference of small building elements (given with spectrum adaptation terms C and  $C_{tr}$ )

$R_w$ : weighted sound reduction index (given with spectrum adaptation terms C and  $C_{tr}$ )

## **2.10 Thermal properties**

No performance determined.

## **2.11 Water vapour permeability**

No performance determined.

## **2.12 Durability and serviceability**

### **2.12.1 Durability**

Hilti Firestop Acrylic Sealant CFS-S ACR fulfils the requirements of use category  $Y_2$  in accordance with ETAG 026-2, Section 1.2. Since the requirements for type  $Y_2$  are met, also the requirements for type  $Z_1$  and  $Z_2$  are fulfilled.

Type  $Y_2$ : Products intended for use at temperatures between  $-5^\circ\text{C}$  and  $+70^\circ\text{C}$ , but with no exposure to rain nor UV.

Type  $Z_1$ : Products intended for use at internal conditions with high humidity, excluding temperatures below  $0^\circ\text{C}$ .<sup>5</sup>

Type  $Z_2$ : Products intended for uses at internal conditions with humidity classes other than  $Z_1$ , excluding temperatures below  $0^\circ\text{C}$ .

### **2.12.2 Serviceability**

#### **2.12.2.1 Electrical properties**

- Volume resistivity (according to DIN IEC 93 (VDE 0303 Part 30):1993-12):  $113\text{E}+10 \pm 36\text{E}+10 \Omega\cdot\text{cm}$ .
- Surface resistivity (according to DIN IEC 93 (VDE 0303 Part 30):1993-12):  $848\text{E}+06 \pm 243\text{E}+06 \Omega$ .

## **3 Evaluation and attestation of conformity and CE marking**

### **3.1 Attestation of Conformity system**

According to the decision 1999/454/EC of the European Commission<sup>6</sup> the system 1 of attestation of conformity applies.

This system of attestation of conformity is defined as follows:

System 1: Certification of the conformity of the product by a notified certification body on the basis of:

(a) Tasks for the manufacturer:

- (1) factory production control;
- (2) further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan;

<sup>5</sup> These uses apply for internal humidity class 5 in accordance with EN ISO 13788

<sup>6</sup> Official Journal of the European Communities N° L 178, 14.7.1999, p. 52



(b) Tasks for the notified body

- (3) initial type-testing of the product;
- (4) initial inspection of factory and of factory production control;
- (5) continuous surveillance, assessment and approval of factory production control.

### 3.2 Responsibilities

#### 3.2.1 Tasks of the Manufacturer

##### 3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the product is in conformity with this European technical approval.

The manufacturer may only use initial / raw / constituent materials (as relevant) stated in the technical documentation of this European technical approval.

The factory production control shall be in accordance with the "Control Plan of 27.10.2010 relating to the European technical approvals ETA-10/0292 and ETA-10/0389" which is part of the technical documentation of this European technical approval.<sup>7</sup> The "Control Plan" is laid down in the context of the factory production control system operated by the manufacturer and deposited at the Österreichisches Institut für Bautechnik.

The manufacturer shall draw up and keep up-to-date documents defining the factory production control that applies. The documentation to be carried out by the manufacturer and the applicable procedures shall be appropriate to the product and manufacturing process. The factory production control shall ensure the conformity of the product to an appropriate level. This involves:

- a) the preparation of documented procedures and instructions relating to factory production control operations.
- b) the effective implementation of these procedures and instructions.
- c) the recording of these procedures and their results.
- d) the use of these results to correct any deviations, repair the effects of such deviations, treat any resulting instances of non-conformity and, if necessary, revise the factory production control to rectify the cause of non-conformity.
- e) a procedure to ensure that both the approval Body and the Notified (Certification) Bodies are advised before any significant change to the product, its components or manufacturing process, is made.
- f) a procedure to ensure that personnel involved in the production processes and the quality control procedures are qualified and adequately trained to carry out their required tasks.
- g) that all testing and measuring equipment is maintained and up to date calibration records are documented.
- h) maintenance of records to ensure every batch produced is clearly labelled with the batch number, which allows traceability to its production to be identified.

For the components which the ETA-holder does not manufacture by himself, he shall make sure that factory production control carried out by the other manufacturers gives the guaranty of the components compliance with the European technical approval.

The factory production control and the provisions taken by the ETA-holder for components not produced by himself shall be in accordance with the control plan relating to this European

<sup>7</sup> The control plan is a confidential part of the European Technical Approval and only handed over to the Notified Body or Bodies involved in the procedure of conformity.

technical approval which is part of the technical documentation of this European technical approval. The "Control Plan" is laid down in the context of the factory production control system operated by the manufacturer and deposited at the Österreichisches Institut für Bautechnik.

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the "Control Plan".

### 3.2.1.2 Other tasks of manufacturer

#### **Additional information**

The manufacturer shall provide a technical data sheet and an installation instruction with the following minimum information (as far as relevant):

technical data sheet:

- Field of application:
  - Building elements in which the product may be installed, type and properties of the building elements like minimum thickness, density, and - in case of lightweight constructions - the construction requirements.
  - Services which may penetrate the building element, type and properties of the services like material, diameter, thickness etc. in case of pipes including insulation materials; necessary/allowed supports/fixings (e.g. cable trays), separations etc.
  - Design of the penetration seal(s) including limits in size, minimum thickness, separations etc. of the penetration seal(s)
  - Definition of ancillary products (e.g. backfilling material) with clear indication whether they are generic or specific.
  - Environmental conditions covered by the ETA.

Installation instruction:

- Steps to be followed
- Procedure in case of retrofitting.
- Stipulations on maintenance, repair and replacement

The manufacturer shall, on the basis of a contract, involve a body (bodies) which is (are) approved for the tasks referred to in section 3.1 in the field of penetration seals in order to undertake the actions laid down in section 3.3. For this purpose, the "control plan" referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body or bodies involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this European technical approval.

### 3.2.2 Tasks of Notified Bodies

The notified body shall perform the

- initial type-testing of the product (for system 1),  
The results of the tests performed as part of the assessment for the European technical approval may be used unless there are changes in the production line or plant. In such cases, the necessary initial type testing has to be agreed between the Österreichisches Institut für Bautechnik and the notified bodies involved.
- initial inspection of factory and of factory production control,  
The notified body shall ascertain that, in accordance with the control plan, the factory (in particular the employees and the equipment) and the factory production control are suitable to ensure continuous and orderly manufacturing of the components according to the specifications mentioned in clause 2 of this ETA.
- continuous surveillance, assessment and approval of factory production control,  
The Notified Body shall visit the factory at least twice a year or once a year for surveillance of this manufacturer having a FPC system complying with a quality management system covering the manufacturing of the approval product components. It has to be verified that the system of factory production control and the specified automated manufacturing process are maintained taking into account the control plan.



These tasks shall be performed in accordance with the provisions laid down in the control plan of this European technical approval.

The notified body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

The notified product certification body involved by the manufacturer shall issue an EC certificate of conformity of the product stating the conformity with the provisions of this European technical approval.

In cases where the provisions of the European technical approval and its control plan are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform the Österreichisches Institut für Bautechnik without delay.

### **3.3 CE marking**

The CE marking shall be affixed on the product itself, on a label attached to it, on its packaging or on the commercial documents accompanying the components of the product. The letters „CE“ shall be followed by the identification number of the Notified Body involved and be accompanied by the following additional information:

- the name and address of the producer (legal entity responsible for the manufacturer),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate of conformity for the product,
- the number of the European technical approval,
- the number of the guideline for European technical approval
- the name and intended use of the product
- “see ETA-10/0292 for relevant characteristics”

## **4 Assumptions under which the fitness of the product(s) for the intended use was favourably assessed**

### **4.1 General**

4.1.1 For evaluating resistance to fire of the penetration seal using " Hilti Firestop Acrylic Sealant CFS-S ACR " as specified in Annex 2 it is assumed that

- the installation of the penetration seal does not affect the stability of the adjacent building elements – even in case of fire,
- the installations are fixed to the adjacent building elements (not to the seal) in accordance with the relevant regulations in such a way that, in case of fire, no additional mechanical load is imposed on the seal,
- the support of the installations is maintained for the classification period required and
- pneumatic dispatch systems, compressed air systems, etc. are switched off by additional means in case of fire.

4.1.2 This European technical approval does not address any risks associated with the emission of dangerous liquids or gases caused by failure of the pipe(s) in case of fire nor does it prove the prevention of the transmission of fire through heat transfer via the medium in the pipes.

4.1.3 This European technical approval does not verify the prevention of destruction of adjacent building elements with fire separating function or of the pipes themselves due to distortion forces caused by extreme temperatures. These risks shall be accounted for by taking appropriate measures when designing or installing the pipe work.

The mounting or hanging of the pipes or the layout of the pipe work shall be implemented in such a way that the pipes and the fire-resistant building elements shall remain functional for at least the time period corresponding to the relevant fire resistance classification given in Annex 2.

- 4.1.4 The risk of downward spread of fire caused by burning material which drips through a pipe to floors below, is not considered in this ETA (see EN 1366-3: 2009-07, section 1).
- 4.1.5 The durability assessment does not take account of the possible effect on the penetration seal of substances permeating through pipe walls.

#### **4.2 Manufacturing**

Hilti Firestop Acrylic Sealant CFS-S ACR shall be produced in accordance with the manufacturing process deposited with Österreichisches Institut für Bautechnik.

The European technical approval is issued for the product on the basis of agreed data/information, deposited with Österreichisches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to Österreichisches Institut für Bautechnik before the changes are introduced. Österreichisches Institut für Bautechnik will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

#### **4.3 Installation**

The arrangement and installation of Hilti Firestop Acrylic Sealant CFS-S ACR shall be done in accordance with the details given in Annex 2 and Annex 3 for the penetration seal(s).

### **5 Indications to the manufacturer**

#### **5.1 Packaging, transport and storage**

In the accompanying document and/or on the packaging the manufacturer shall give information as to transport and storage.

At least the following shall be indicated: storing temperature, type of storage, maximum duration of storage and required data related to minimum temperature for transport and storage.

#### **5.2 Use, maintenance, repair**

The fire resistance of penetration seals executed using Hilti Firestop Acrylic Sealant CFS-S ACR shall not be negatively affected by future changes to buildings or building elements.

The assessment of the fitness for use is based on the assumption that damaged seals are replaced or repaired. It is also assumed that replacement of components during maintenance/repair will be undertaken using materials specified by this European technical approval.

On behalf of Österreichisches Institut für Bautechnik

Rainer Mikulits  
Managing Director

## ANNEX 1

### DESCRIPTION OF THE PRODUCT AND ANCILLARY PRODUCT(S)

#### 1.1 Product

##### Hilti Firestop Acrylic Sealant CFS-S ACR

Cartridge 310 ml, Foil pack 580 ml, Bucket 5 l / 19 l

Suitable dispensers:

Hilti CB 200-P1 (for 310 ml cartridge)

Hilti CS 270-P1 (for 580 ml foil pack)

A detailed specification of the product is contained in document "Identification / Product Specification relating to the European technical approval ETA-10/0292 and ETA-10/0389 - Hilti Firestop Acrylic Sealant CFS-S ACR" which is a non-public part of this ETA.

The Control Plan is defined in document "Control plan relating to the European technical approval ETA-10/0292 and ETA-10/0389 - Hilti Firestop Acrylic Sealant CFS-S ACR" which is a non-public part of this ETA.

#### technical product literature:

- "technical Data Sheet Hilti Firestop Acrylic Sealant CFS-S ACR"

#### 1.2 Ancillary Products

##### 1.2.1 Mineral wool products suitable for being used as backfilling material

Loose stone wool or stone wool mats with a minimum density of 45 kg/m<sup>3</sup>.

##### 1.2.2 Mineral wool products suitable for being used as pipe insulation

Manufacturer	Product designation
Isover	Protect BSR 90 alu
Paroc	PAROC Section AluCoat T
Rockwool	Conlit 150 P
Rockwool	Klimarock
Rockwool	Rockwool 800 pipe sections

##### 1.2.3 OKTAGON formwork tie rod system ("Schalungsspannstelle")

The formwork tie rod system is made of HDPE and available in different lengths for a wall thickness up to 600 mm. Inner diameter: 22 mm, diameter of protection flange: 60 mm.

Manufacturer: Nevoga GmbH, Freilassing, Germany ([www.nevoga.com](http://www.nevoga.com))

Distributors in:<sup>8</sup>

Austria: Haberkorn GmbH ("Kombispreise Oktagon")  
(<http://shop.haberkorn.com/>), Wolfurt; Ö-BAU Fetter Baumarkt GmbH,  
Korneuburg ([www.fetter.at](http://www.fetter.at))

Czech Republic: KORN, spol. s r.o., Brno; Stavební Centrum® e-shop

Germany: Kuhne Baugeräte GmbH, Türkheim/Bayern

Switzerland: Cementwaren Kobler GmbH, Widnau



<sup>8</sup> The list is not intended being exhaustive

#### **1.2.4 Formwork distance control pipe ("Abstandsrohr")**

The formwork distance control pipe is a weather resistant plastic pipe with enhanced impact resistance. It is available in lengths of 2000 to 2500 mm and cut to the required length on site. Inner diameter: 26 mm, outer diameter 32 mm.

Manufacturer: Nevoga GmbH, Freilassing, Germany ([www.nevoga.com](http://www.nevoga.com))

Distributors in:<sup>8</sup>

Austria: Haberkorn GmbH ("Haberkorn Distanzrohr")  
(<http://shop.haberkorn.com/>), Wolfurt; Ö-BAU Fetter Baumarkt GmbH,  
Korneuburg ([www.fetter.at](http://www.fetter.at))

Czech Republic: KORN, spol. s r.o., Brno; Stavební Centrum® e-shop

Germany: Kuhne Baugeräte GmbH, Türkheim/Bayern



## ANNEX 2

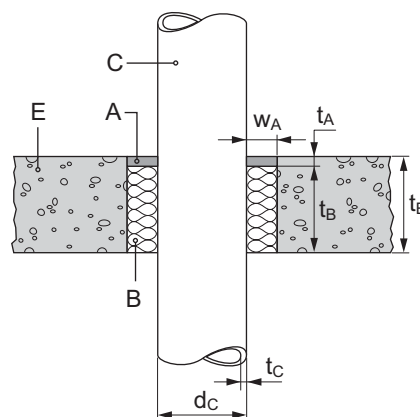
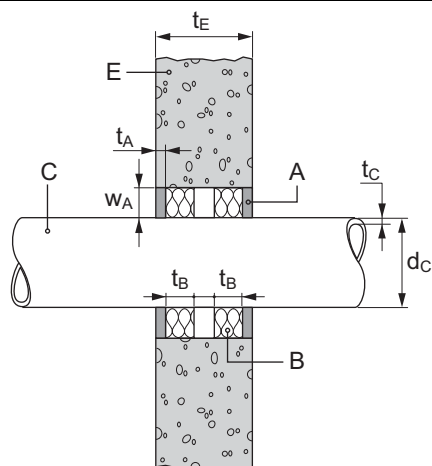
### RESISTANCE TO FIRE CLASSIFICATION OF PENETRATION SEALS MADE OF HILTI FIRESTOP ACRYLIC SEALANT CFS-S ACR

#### 2.1 Rigid walls and rigid floors according to 1.2.1 d) and f)

##### Penetration seal:

Wall: 15 mm ( $t_A$ ) Hilti Firestop Acrylic Sealant CFS-S ACR (A) on both sides, stone wool according to Annex 1.2.1 (B) as backfilling material ( $t_B$  = minimum 50 mm on both sides)

Floor: 15 mm Hilti Firestop Acrylic Sealant CFS-S ACR (A) on the upper side, stone wool according to Annex 1.2.1 (B) as backfilling material ( $t_B$  = gap filled completely)



Penetrating services	Classification
<b>Steel pipes non-insulated (C)</b> Single penetration Distance between pipe and seal edge: Wall (width of annular space, $w_A$ ): 10,5 - 35,5 mm; Floor: Maximum seal diameter: 260 mm (annular space $w_A$ depending on pipe diameter) Pipe diameter ( $d_C$ ) between Ø32 mm and Ø159 mm, with minimum wall thickness ( $t_C$ ) 1,8 mm and 4,5 mm respectively <sup>9</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	E 180-C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)	

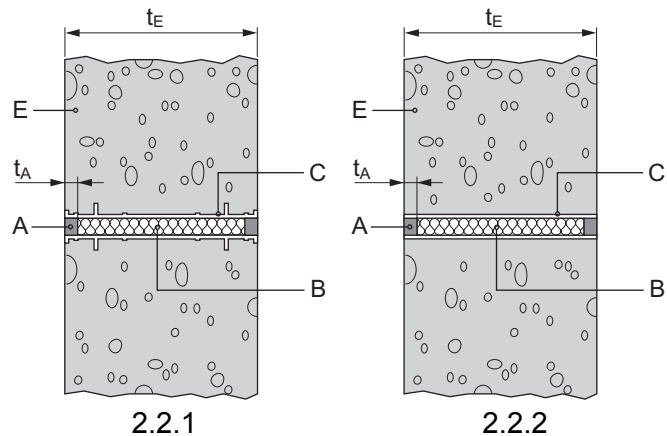
<sup>9</sup> Interpolation of minimum pipe wall thickness between 1,8 mm for diameter 32 mm and 4,5 mm for diameter 159 mm for pipe diameters in between.

<sup>10</sup> 14,2 mm is the maximum value covered by the rules in EN 1366-3. This value may be limited by the particular pipe dimensions available in practice.

## 2.2 Rigid walls according to 1.2.1 c)

### Penetration seal:

15 mm ( $t_A$ ) Hilti Firestop Acrylic Sealant CFS-S ACR (A) on both sides of the opening of the formwork tie system / formwork distance pipe (C), loose stone wool (B) as backfilling material ( $t_B$  = gap filled completely)



Penetrating services

Classification

**2.2.1 OKTAGON formwork tie rod system ("Schalungsspannstelle", "Oktagon-Spreize")** - see Annex 1.2.3

EI 120

**2.2.2 Formwork distance pipe ("Abstandsrohr", "Distanzrohr")** - see Annex 1.2.4

EI 120

## 2.3 Flexible wall according to 1.2.1 a) and rigid wall according to 1.2.1 b)

### Penetration seal:

10 mm ( $t_A$ ) Hilti Firestop Acrylic Sealant CFS-S ACR (A) on both sides of the wall, stone wool according to Annex 1.2.1 (B) as backfilling material ( $t_B$  = gap filled completely)

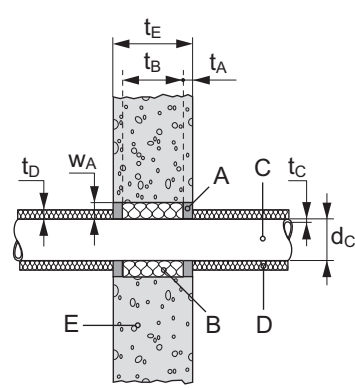
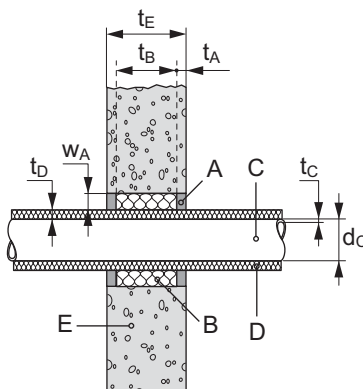
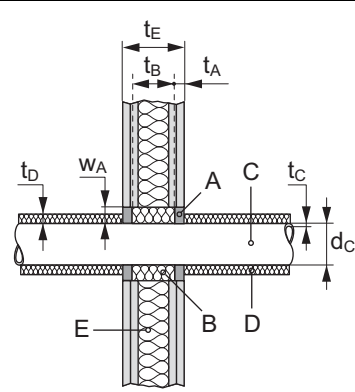
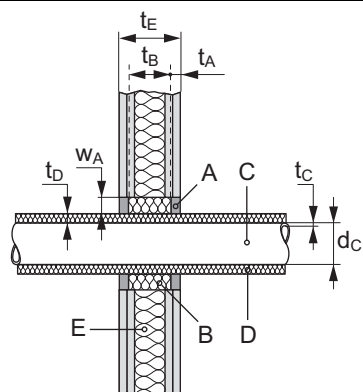
Maximum seal diameter: 300 mm (annular space  $w_A$  depending on pipe diameter)

Pipe insulation made of mineral wool according to Annex 1.2.2.

### 2.3.1 Continued pipe insulation

Sustained insulation

Interrupted insulation





<b>Penetrating services</b>	
<b>Steel pipes (C) with continued insulation (D) – sustained</b>	Classification
Insulation thickness ( $t_D$ ) $\geq 20$ mm: Pipe diameter ( $d_C$ ) between $\varnothing 26,9$ mm and $\varnothing 48,3$ mm, with minimum wall thickness ( $t_C$ ) 1,4 mm and 1,6 mm respectively <sup>11</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
Insulation thickness ( $t_D$ ) $\geq 40$ mm: Pipe diameter ( $d_C$ ) between $\varnothing 26,9$ mm and $\varnothing 168,3$ mm, with minimum wall thickness ( $t_C$ ) 1,4 mm and 2,6 mm respectively <sup>12</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
<b>Steel pipes (C) with continued insulation (D) – interrupted</b>	
Insulation thickness ( $t_D$ ) $\geq 20$ mm: Pipe diameter ( $d_C$ ) between $\varnothing 26,9$ mm and $\varnothing 48,3$ mm, with minimum wall thickness ( $t_C$ ) 1,4 mm and 1,6 mm respectively <sup>11</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
Insulation thickness ( $t_D$ ) $\geq 40$ mm: Pipe diameter ( $d_C$ ) between $\varnothing 26,9$ mm and $\varnothing 168,3$ mm, with minimum wall thickness ( $t_C$ ) 1,4 mm and 2,6 mm respectively <sup>12</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)	
<b>Copper pipes (C) with continued insulation (D) – sustained</b>	Classification
Insulation thickness ( $t_D$ ) $\geq 20$ mm: Pipe diameter ( $d_C$ ) between $\varnothing 28$ mm and $\varnothing 42$ mm, with minimum wall thickness ( $t_C$ ) 1,0 mm and 1,5 mm respectively <sup>13</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
Insulation thickness ( $t_D$ ) $\geq 40$ mm: Pipe diameter ( $d_C$ ) between $\varnothing 42$ mm and $\varnothing 88,9$ mm, with minimum wall thickness ( $t_C$ ) 1,5 mm and 2,0 mm respectively <sup>14</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 90-C/U
<b>Copper pipes (C) with continued insulation (D) – interrupted</b>	
Insulation thickness ( $t_D$ ) $\geq 20$ mm: Pipe diameter ( $d_C$ ) between $\varnothing 28$ mm and $\varnothing 42$ mm, with minimum wall thickness ( $t_C$ ) 1,0 mm and 1,5 mm respectively <sup>13</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
Insulation thickness ( $t_D$ ) $\geq 40$ mm: Pipe diameter ( $d_C$ ) between $\varnothing 42$ mm and $\varnothing 88,9$ mm, with minimum wall thickness ( $t_C$ ) 1,5 mm and 2,0 mm respectively <sup>14</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.	

<sup>11</sup> Interpolation of minimum pipe wall thickness between 1,4 mm for diameter 26,9 mm and 1,6 mm for diameter 48,3 mm for pipe diameters in between.

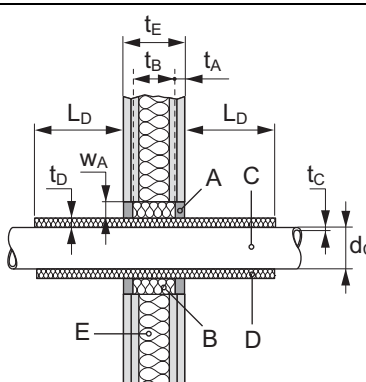
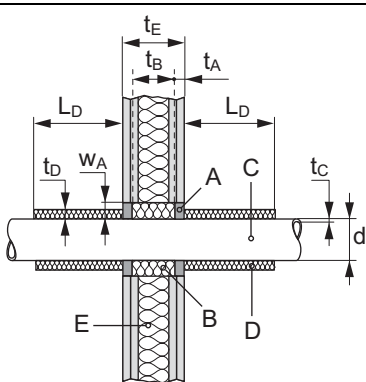
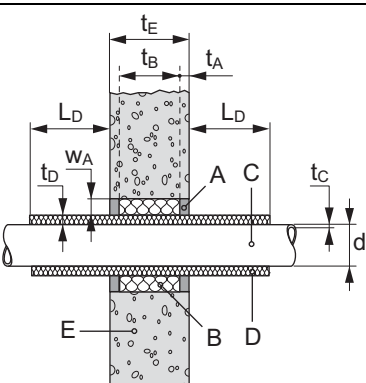
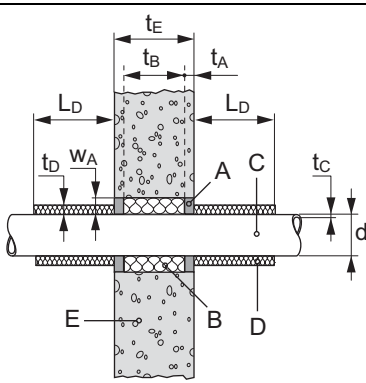
<sup>12</sup> Interpolation of minimum pipe wall thickness between 1,4 mm for diameter 26,9 mm and 2,6 mm for diameter 168,3 mm for pipe diameters in between.

<sup>13</sup> Interpolation of minimum pipe wall thickness between 1,0 mm for diameter 28 mm and 1,5 mm for diameter 42 mm for pipe diameters in between.

<sup>14</sup> Interpolation of minimum pipe wall thickness between 1,5 mm for diameter 42 mm and 2,0 mm for diameter 88,9 mm for pipe diameters in between.

<b>Geberit Mepla pipes (C) with continued insulation (D) – sustained</b> Produced by Geberit Int., Jona, CH	Classification
Insulation thickness ( $t_D$ ) $\geq 20$ mm: Pipe dimensions ( $d_C$ , $t_C$ ): $\varnothing 16 \times 2,25$ mm $\varnothing 20 \times 2,5$ mm $\varnothing 26 \times 3,0$ mm $\varnothing 32 \times 3,5$ mm	EI 120-U/C

### 2.3.2 Local pipe insulation

Sustained insulation	Interrupted insulation
	
	

### Steel pipes (C) with local insulation (D) – sustained

Insulation		Pipe		Classification
thickness ( $t_D$ ) [mm]	length ( $L_D$ ) [mm]	diameter ( $d_C$ ) [mm]	wall thickness ( $t_C$ ) [mm]	
20	$\geq 450$	26,9 – 48,3	1,4 / 1,6 <sup>11</sup> – 14,2 <sup>10</sup>	EI 120-C/U
20 - 40	$\geq 500$	48,3	1,6 – 14,2 <sup>10</sup>	EI 120-C/U
40	$\geq 450$	48,3 – 168,3	1,6 / 2,6 <sup>15</sup> – 14,2 <sup>10</sup>	EI 90-C/U
40	$\geq 700$	48,3 – 168,3	1,6 / 2,6 <sup>15</sup> – 14,2 <sup>10</sup>	EI 120-C/U

<sup>15</sup> Interpolation of minimum pipe wall thickness between 1,6 mm for diameter 48,3 mm and 2,6 mm for diameter 168,3 mm for pipe diameters in between.

<b>Steel pipes (C) with local insulation (D) – interrupted</b>				
Insulation		Pipe		Classification
thickness ( $t_D$ ) [mm]	length ( $L_D$ ) [mm]	diameter ( $d_C$ ) [mm]	wall thickness ( $t_C$ ) [mm]	
20	$\geq 500$	26,9 – 48,3	1,4 – 14,2 <sup>10</sup>	EI 120-C/U
40	$\geq 500$	168,3	2,6 – 4,5	EI 90-C/U
40	$\geq 500$	168,3	4,5 – 14,2 <sup>10</sup>	EI 120-C/U
40	$\geq 700$	168,3	2,6 – 14,2 <sup>10</sup>	EI 120-C/U
40	$\geq 700$	48,3 – 168,3	1,6 / 2,6 <sup>15</sup> – 14,2 <sup>10</sup>	EI 90-C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)				
<b>Copper pipes (C) with local insulation (D) – sustained</b>				
Insulation		Pipe		Classification
thickness ( $t_D$ ) [mm]	length ( $L_D$ ) [mm]	diameter ( $d_C$ ) [mm]	wall thickness ( $t_C$ ) [mm]	
20	$\geq 450$	28 – 42	1,0 / 1,5 <sup>13</sup> – 14,2 <sup>10</sup>	EI 120-C/U
20 - 40	$\geq 500$	42	1,5 – 14,2 <sup>10</sup>	EI 120-C/U
40	$\geq 500$	42 – 88,9	1,5 / 2,0 <sup>14</sup> – 14,2 <sup>10</sup>	EI 90-C/U
40	$\geq 700$	88,9	2,0 – 14,2 <sup>10</sup>	EI 120-C/U
<b>Copper pipes (C) with local insulation (D) – interrupted</b>				
Insulation		Pipe		Classification
thickness ( $t_D$ ) [mm]	length ( $L_D$ ) [mm]	diameter ( $d_C$ ) [mm]	wall thickness ( $t_C$ ) [mm]	
20	$\geq 500$	28 – 42	1,0 / 1,5 <sup>13</sup> – 14,2 <sup>10</sup>	EI 120-C/U
20 - 40	$\geq 500$	42	1,5 – 14,2 <sup>10</sup>	EI 120-C/U
40	$\geq 500$	42 – 88,9	1,5 / 2,0 <sup>14</sup> – 14,2 <sup>10</sup>	EI 120-C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.				
<b>Geberit Mepla pipes (C) with local insulation (D) – sustained</b>				Classification
Insulation thickness ( $t_D$ ) 20 mm, insulation length ( $L_D$ ) $\geq 500$ mm: Pipe dimensions ( $d_C$ , $t_C$ ): Ø 16 x 2,25 mm Ø 20 x 2,5 mm Ø 26 x 3,0 mm Ø 32 x 3,5 mm				EI 120-C/U

## 2.4 Rigid floor according to 1.2.1 e)

### Penetration seal:

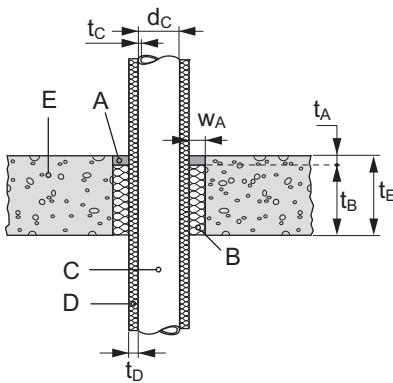
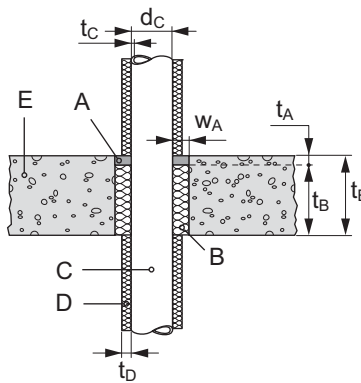
10 mm ( $t_A$ ) Hilti Firestop Acrylic Sealant CFS-S ACR (A) on the top side of the floor construction, stone wool according to Annex 1.2.1 (B) as backfilling material ( $t_B$  = gap filled completely)

For classifications EI 90-C/U and EI 120-C/U: Maximum seal diameter: 300 mm (annular space  $w_A$  depending on pipe diameter)

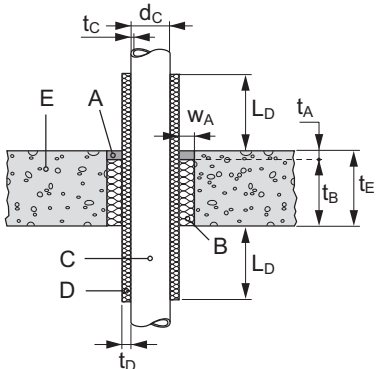
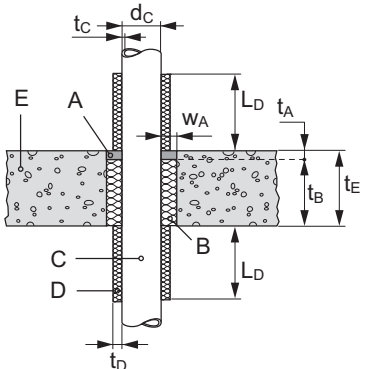
For classifications EI 180-C/U: Distance between pipe and seal edge in floor constructions (width of annular space,  $w_A$ ): 13 - 48 mm

Pipe insulation made of mineral wool according to Annex 1.2.2.

### 2.4.1 Continued pipe insulation

Sustained insulation	Interrupted insulation
	
Penetrating services	
Steel pipes (C) with continued insulation (D) – sustained	Classification
Insulation thickness ( $t_D$ ) $\geq$ 20 mm: Pipe diameter ( $d_C$ ) between $\varnothing$ 26,9 mm and $\varnothing$ 48,3 mm, with minimum wall thickness ( $t_C$ ) 1,4 mm and 1,6 mm respectively <sup>11</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 180-C/U
Insulation thickness ( $t_D$ ) $\geq$ 40 mm: Pipe diameter ( $d_C$ ) between $\varnothing$ 26,9 mm and $\varnothing$ 168,3 mm, with minimum wall thickness ( $t_C$ ) 1,4 mm and 2,6 mm respectively <sup>12</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
Steel pipes (C) with continued insulation (D) – interrupted	
Insulation thickness ( $t_D$ ) $\geq$ 20 mm: Pipe diameter ( $d_C$ ) between $\varnothing$ 26,9 mm and $\varnothing$ 48,3 mm, with minimum wall thickness ( $t_C$ ) 1,4 mm and 1,6 mm respectively <sup>11</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 180-C/U
Insulation thickness ( $t_D$ ) $\geq$ 40 mm: Pipe diameter ( $d_C$ ) between $\varnothing$ 26,9 mm and $\varnothing$ 168,3 mm, with minimum wall thickness ( $t_C$ ) 1,4 mm and 2,6 mm respectively <sup>12</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)	

<b>Copper pipes (C) with continued insulation (D) – sustained</b>	Classification
Insulation thickness ( $t_D$ ) $\geq 20$ mm: Pipe diameter ( $d_C$ ) $\varnothing 42$ mm, with minimum wall thickness ( $t_C$ ) 1,5 mm and maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
Insulation thickness ( $t_D$ ) $\geq 40$ mm: Pipe diameter ( $d_C$ ) between $\varnothing 42$ mm and $\varnothing 88,9$ mm, with minimum wall thickness ( $t_C$ ) 1,5 mm and 2,0 mm respectively <sup>14</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 90-C/U
<b>Copper pipes (C) with continued insulation (D) – interrupted</b>	Classification
Insulation thickness ( $t_D$ ) $\geq 20$ mm: Pipe diameter ( $d_C$ ) between $\varnothing 28$ mm and $\varnothing 42$ mm, with minimum wall thickness ( $t_C$ ) 1,0 mm and 1,5 mm respectively <sup>13</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
Insulation thickness ( $t_D$ ) $\geq 40$ mm: Pipe diameter ( $d_C$ ) $\varnothing 42$ mm, with minimum wall thickness ( $t_C$ ) 1,5 mm, maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.	
<b>Geberit Mepla pipes (C) with continued insulation (D) – sustained</b>	Classification
Insulation thickness ( $t_D$ ) $\geq 20$ mm: Pipe dimensions ( $d_C$ , $t_C$ ): $\varnothing 16 \times 2,25$ mm $\varnothing 20 \times 2,5$ mm $\varnothing 26 \times 3,0$ mm $\varnothing 32 \times 3,5$ mm	EI 90-U/C

2.4.2 Local pipe insulation				
Sustained insulation			Interrupted insulation	
				
Steel pipes (C) with local insulation (D) – sustained				
Insulation		Pipe		Classification
thickness ( $t_D$ ) [mm]	length ( $L_D$ ) [mm]	diameter ( $d_C$ ) [mm]	wall thickness ( $t_C$ ) [mm]	
20	$\geq 450$	26,9 – 48,3	1,4 / 1,6 <sup>11</sup> – 14,2 <sup>10</sup>	EI 180-C/U
40	$\geq 500$	168,3	2,6 – 14,2 <sup>10</sup>	EI 90-C/U
40	$\geq 700$	168,3	2,6 – 14,2 <sup>10</sup>	EI 120-C/U

<b>Steel pipes (C) with local insulation (D) – interrupted</b>				
Insulation		Pipe		Classification
thickness ( $t_D$ ) [mm]	length ( $L_D$ ) [mm]	diameter ( $d_C$ ) [mm]	wall thickness ( $t_C$ ) [mm]	
20	$\geq 500$	26,9 – 48,3	1,4 / 1,6 <sup>11</sup> – 14,2 <sup>10</sup>	EI 180-C/U
40	$\geq 500$	168,3	2,6 – 14,2 <sup>10</sup>	EI 120-C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)				
<b>Copper pipes (C) with local insulation (D) – sustained</b>				
Insulation		Pipe		Classification
thickness ( $t_D$ ) [mm]	length ( $L_D$ ) [mm]	diameter ( $d_C$ ) [mm]	wall thickness ( $t_C$ ) [mm]	
20	$\geq 450$	42	1,5 – 14,2 <sup>10</sup>	EI 120-C/U
20 - 40	$\geq 700$	42	1,5 – 14,2 <sup>10</sup>	EI 120-C/U
40	$\geq 700$	42 – 88,9	1,5 / 2,0 <sup>14</sup> – 14,2 <sup>10</sup>	EI 120-C/U
40	$\geq 500$	88,9	2,0 – 14,2 <sup>10</sup>	EI 90-C/U
40	$\geq 700$	88,9	2,0 – 14,2 <sup>10</sup>	EI 180-C/U
<b>Copper pipes (C) with local insulation (D) – interrupted</b>				
Insulation		Pipe		Classification
thickness ( $t_D$ ) [mm]	length ( $L_D$ ) [mm]	diameter ( $d_C$ ) [mm]	wall thickness ( $t_C$ ) [mm]	
20 - 40	$\geq 600$	28 – 42	1,0 / 1,5 <sup>13</sup> – 14,2 <sup>10</sup>	EI 120-C/U
40	$\geq 500$	28 – 42	1,0 / 1,5 <sup>13</sup> – 14,2 <sup>10</sup>	EI 120-C/U
20 - 40	$\geq 500$	42	1,5 – 14,2 <sup>10</sup>	EI 120-C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.				
<b>Geberit Mepla pipes (C) with local insulation (D) – sustained</b>				Classification
Insulation thickness ( $t_D$ ) 20 mm, insulation length ( $L_D$ ) $\geq 500$ mm: Pipe dimensions ( $d_C$ , $t_C$ ): Ø 16 x 2,25 mm Ø 20 x 2,5 mm Ø 26 x 3,0 mm Ø 32 x 3,5 mm				EI 90-U/C



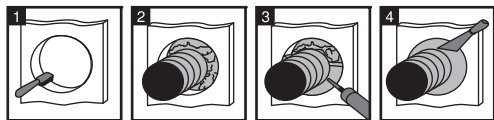
<b>2.5 Rigid floor according to 1.2.1 f)</b>	
<b>Penetration seal:</b> See Annex 2.4, except that the maximum seal diameter for classifications EI 180-C/U is 260 mm with the annular space ( $w_A$ ) depending on the pipe diameter.	
<b>2.5.1 Continued pipe insulation</b>	
<b>Steel pipes (C) with continued insulation (D) – sustained</b>	Classification
See 2.4	
<b>Steel pipes (C) with continued insulation (D) – interrupted</b>	Classification
See 2.4	
<b>Copper pipes (C) with continued insulation (D) – sustained</b>	Classification
Insulation thickness ( $t_D$ ) $\geq 20$ mm: Pipe diameter ( $d_C$ ) $\varnothing$ 28 mm, with minimum wall thickness ( $t_C$ ) 1,0 mm and maximum wall thickness 14,2 mm <sup>10</sup>	EI 180-C/U
Insulation thickness ( $t_D$ ) $\geq 20$ mm: Pipe diameter ( $d_C$ ) $\varnothing$ between $\varnothing$ 28 mm and $\varnothing$ 42 mm, with minimum wall thickness ( $t_C$ ) 1,0 mm and 1,5 mm respectively <sup>14</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
Insulation thickness ( $t_D$ ) $\geq 40$ mm: Pipe diameter ( $d_C$ ) between $\varnothing$ 42 mm and $\varnothing$ 88,9 mm, with minimum wall thickness ( $t_C$ ) 1,5 mm and 2,0 mm respectively <sup>14</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 90-C/U
<b>Copper pipes (C) with continued insulation (D) – interrupted</b>	Classification
Insulation thickness ( $t_D$ ) $\geq 20$ mm: Pipe diameter ( $d_C$ ) between $\varnothing$ 28 mm and $\varnothing$ 42 mm, with minimum wall thickness ( $t_C$ ) 1,0 mm and 1,5 mm respectively <sup>13</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
Insulation thickness ( $t_D$ ) $\geq 40$ mm: Pipe diameter ( $d_C$ ) between $\varnothing$ 42 mm and $\varnothing$ 88,9 mm, with minimum wall thickness ( $t_C$ ) 1,5 mm and 2,0 mm respectively <sup>14</sup> , maximum wall thickness 14,2 mm <sup>10</sup>	EI 120-C/U
Insulation thickness ( $t_D$ ) $\geq 40$ mm: Pipe diameter ( $d_C$ ) $\varnothing$ 88,9 mm, with minimum wall thickness ( $t_C$ ) 2,0 mm, maximum wall thickness 14,2 mm <sup>10</sup>	EI 180-C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.	
<b>Geberit Mepla pipes (C) with continued insulation (D) – sustained</b>	Classification
See 2.4	

<b>2.5.2 Local pipe insulation</b>				
<b>Steel pipes (C) with local insulation (D) – sustained</b>				Classification
See 2.4				
<b>Steel pipes (C) with local insulation (D) – interrupted</b>				Classification
See 2.4				
<b>Copper pipes (C) with local insulation (D) – sustained</b>				
Insulation		Pipe		Classification
thickness ( $t_D$ ) [mm]	length ( $L_D$ ) [mm]	diameter ( $d_C$ ) [mm]	wall thickness ( $t_C$ ) [mm]	
20	$\geq 425$	28	1,0 – 14,2 <sup>10</sup>	EI 180-C/U
20	$\geq 450$	28 - 42	1,0 / 1,5 <sup>13</sup> – 14,2 <sup>10</sup>	EI 120-C/U
20 - 40	$\geq 700$	42	1,5 – 14,2 <sup>10</sup>	EI 120-C/U
40	$\geq 700$	42 – 88,9	1,5 / 2,0 <sup>14</sup> – 14,2 <sup>10</sup>	EI 120-C/U
40	$\geq 500$	88,9	2,0 – 14,2 <sup>10</sup>	EI 90-C/U
40	$\geq 700$	88,9	2,0 – 14,2 <sup>10</sup>	EI 180-C/U
<b>Copper pipes (C) with local insulation (D) – interrupted</b>				
Insulation		Pipe		Classification
thickness ( $t_D$ ) [mm]	length ( $L_D$ ) [mm]	diameter ( $d_C$ ) [mm]	wall thickness ( $t_C$ ) [mm]	
20 - 40	$\geq 500$	28 – 42	1,0 / 1,5 <sup>13</sup> – 14,2 <sup>10</sup>	EI 120-C/U
40	$\geq 500$	42 – 88,9	1,5 / 2,0 <sup>14</sup> – 14,2 <sup>10</sup>	EI 120-C/U
40	$\geq 500$	88,9	2,0 – 14,2 <sup>10</sup>	EI 180-C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.				
<b>Geberit Mepla pipes (C) with local insulation (D) – sustained</b>				Classification
See 2.4				

### ANNEX 3

#### INSTALLATION OF THE PRODUCT AND ANCILLARY PRODUCT(S)

The arrangement and installation of Hilti Firestop Acrylic Sealant CFS-S ACR shall be done in accordance with the details given below and in Annex 2 for the penetration seal(s).



Apertures for the penetration of pipes require a minimum separation of 200 mm.

Pipes shall be supported at maximum 270 mm away from both faces of wall constructions and at maximum 250 mm from the upper face of floor constructions.

Application temperature: +5°C to +40°C.

## ANNEX 4

### ABBREVIATIONS AND REFERENCE DOCUMENTS

#### 4.1 Abbreviations used in drawings

Abbreviation	Description	Abbreviation	Description
A, A <sub>1</sub> , A <sub>2</sub> ,...	Firestop product	s <sub>1</sub> , s <sub>2</sub>	Distances
B	Backfilling material	t <sub>A</sub>	Thickness of penetration seal
C, C <sub>1</sub> , C <sub>2</sub> ,...	Penetrating services	t <sub>B</sub>	Thickness of backfilling material
D	Pipe insulation	t <sub>C</sub>	Pipe wall thickness
E, E <sub>1</sub> , E <sub>2</sub> ,...	Building element (wall, floor)	t <sub>D</sub>	Thickness of insulation
L <sub>D</sub>	Length of insulation	t <sub>E</sub>	Thickness of the building element
d <sub>C</sub>	Pipe diameter	w <sub>A</sub>	Width of penetration seal (annular space)
h	Height/length of penetration seal		

#### 4.2 References to standards mentioned in the ETA

DIN IEC 60093 (VDE 0303 Part 30) Methods of test for insulating materials for electrical purposes:

Volume resistivity and surface resistivity of solid electrical insulating materials

EN 1026 Windows and doors – Air permeability – Test method

EN 1366-3 Fire resistance tests for service installations - Part 3: Penetration seals

EN 13501 Fire classification of construction products and building elements –  
Part 1: Classification using test data from reaction to fire tests  
Part 2: Classification using test data from fire resistance tests, excluding ventilation services

EN ISO 140-3 Acoustics – Measurement of sound insulation in buildings and of building elements – Part 3: Laboratory measurements of airborne sound insulation of building elements<sup>16</sup>

EN ISO 140-10 Acoustics – Measurements of sound insulation in buildings and of building elements – Part 10: Laboratory measurement of airborne sound insulation of small building elements<sup>16</sup>

EN ISO 717-1 Acoustics – Rating of sound insulation of buildings and of building elements – Part 1: Airborne sound insulation

#### 4.3 Other reference documents

EOTA TR 001 Determination of impact resistance of panels and panel assemblies

EOTA TR 024 Characterisation, Aspects of Durability and Factory Production Control for Reactive Materials, Components and Products

Safety Data Sheet according to 1907/2006/EC, Article 31, for Hilti Firestop Acrylic Sealant CFS-S ACR

<sup>16</sup> In September 2010 substituted by the EN ISO 10140 series